

AD-A037 706

MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND TECHNOLOGY F/G 17/1
A TRINAURAL METHOD FOR SOUND RANGING. VOLUME II. APPENDIX. SET --ETC(U)
FEB 65 A R HERCZ

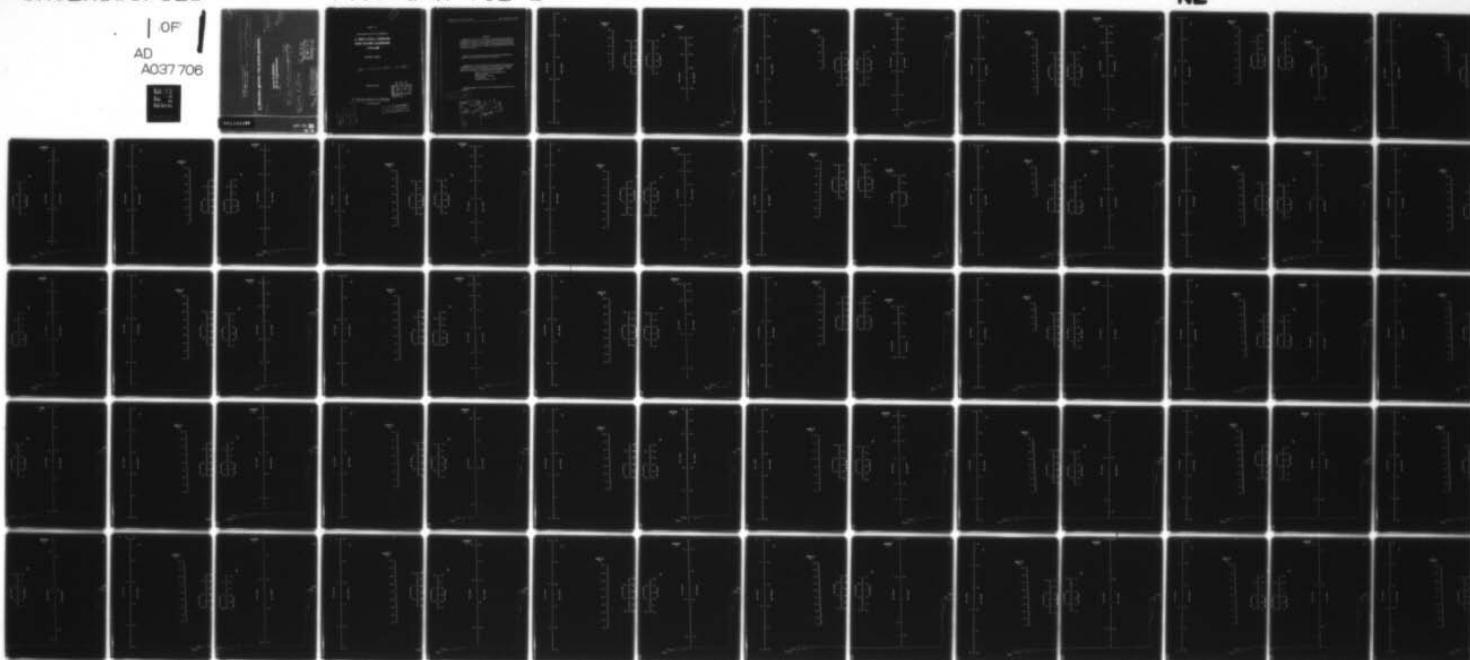
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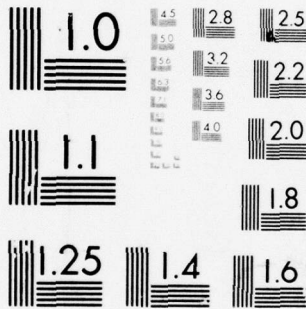
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A TRINAURAL METHOD FOR SOUND RANGING.

Volume II, APPENDIX,
SET OF 33 NOMOGRAMS,

15

DA-28-443-AMC-00013(F)

10

Arthur R. Hercz

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Memo. of Project Michigan,

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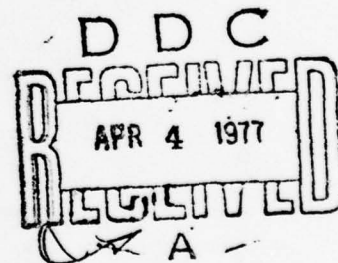
Memorandum of Project MICHIGAN

**A TRINAURAL METHOD
FOR SOUND RANGING**
Volume II

ARTHUR R. HERCZ

DA-28-043-AMC-0013(E)

February 1965



Institute of Science and Technology
THE UNIVERSITY OF MICHIGAN
Ann Arbor, Michigan

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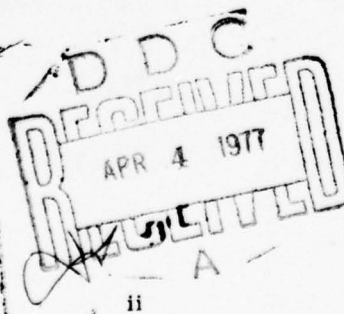
Chief, U. S. Army Electronics Laboratories
Willow Run Office
The University of Michigan
P. O. Box 618
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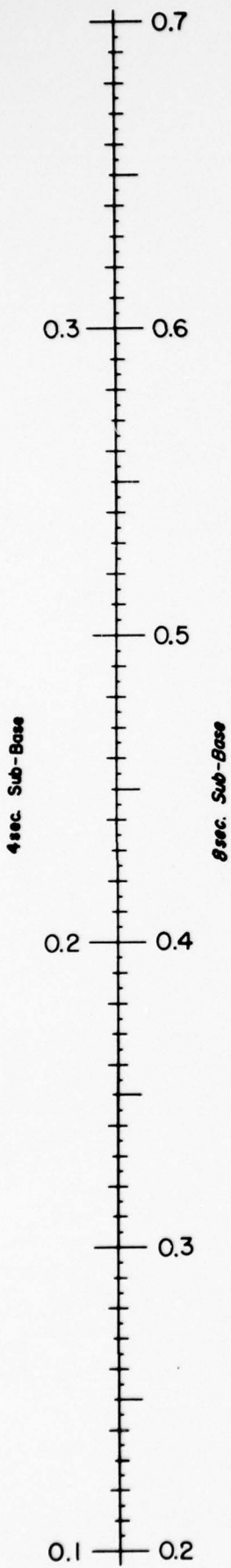
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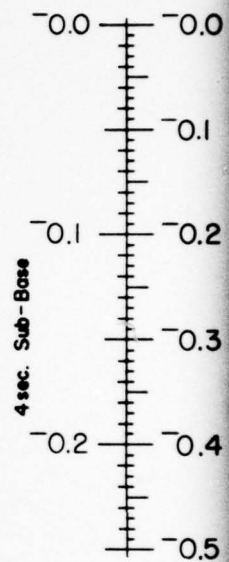
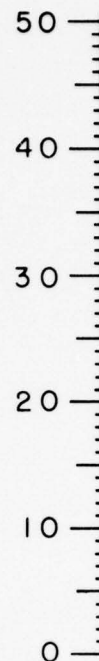
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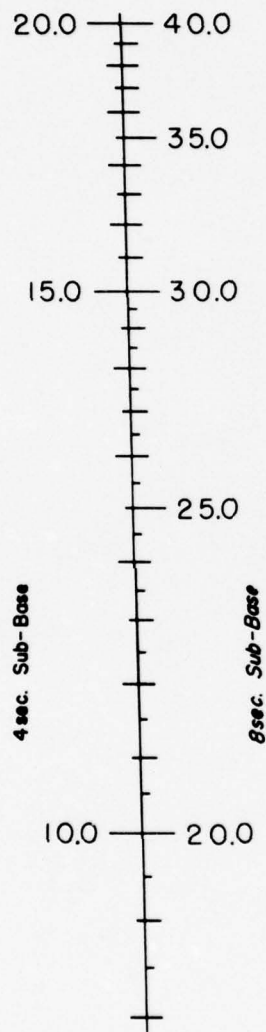
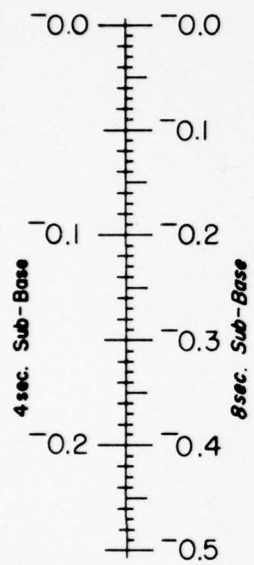
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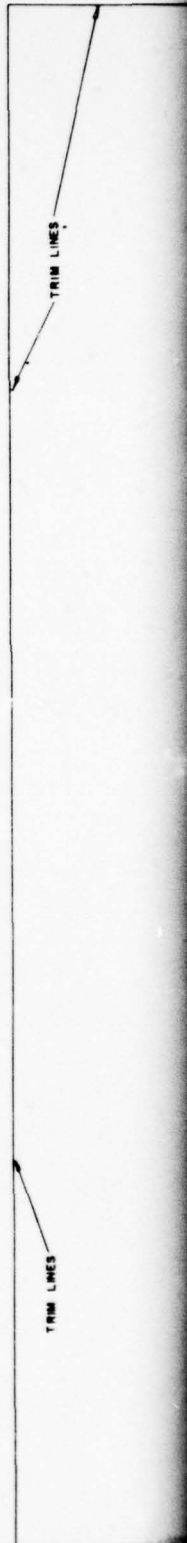
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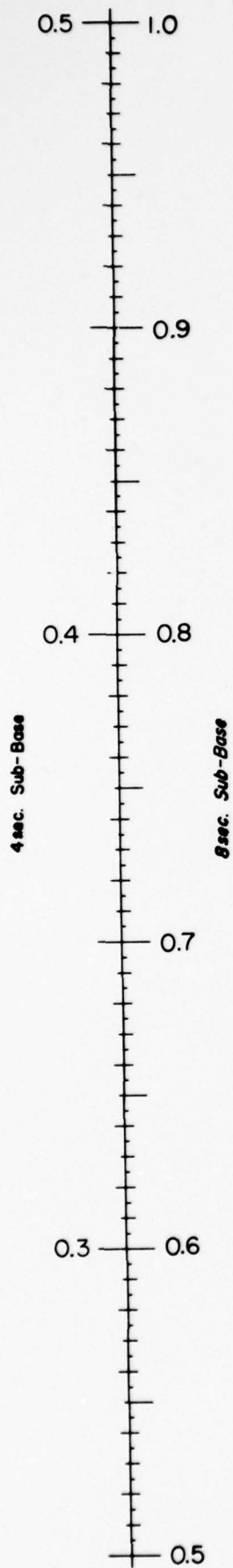
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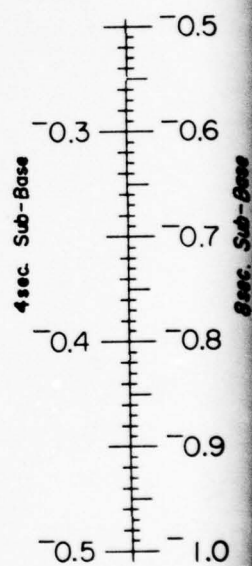
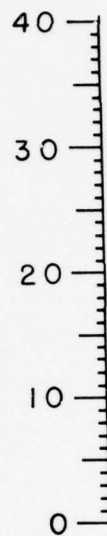
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ANGLE
(mils.)



RANGE
(Km.)

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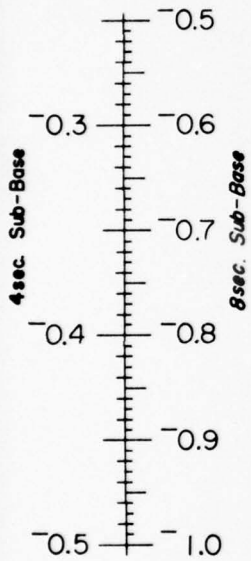
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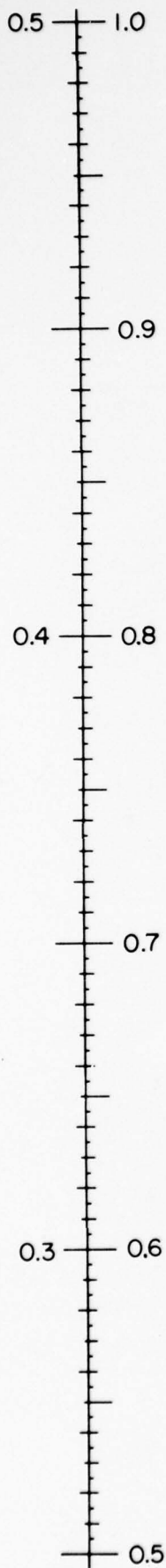
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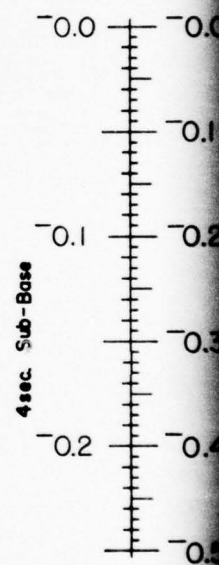
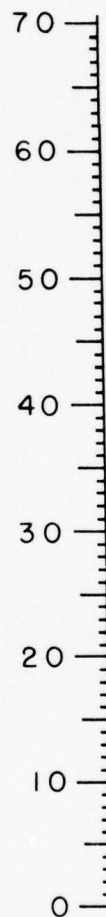
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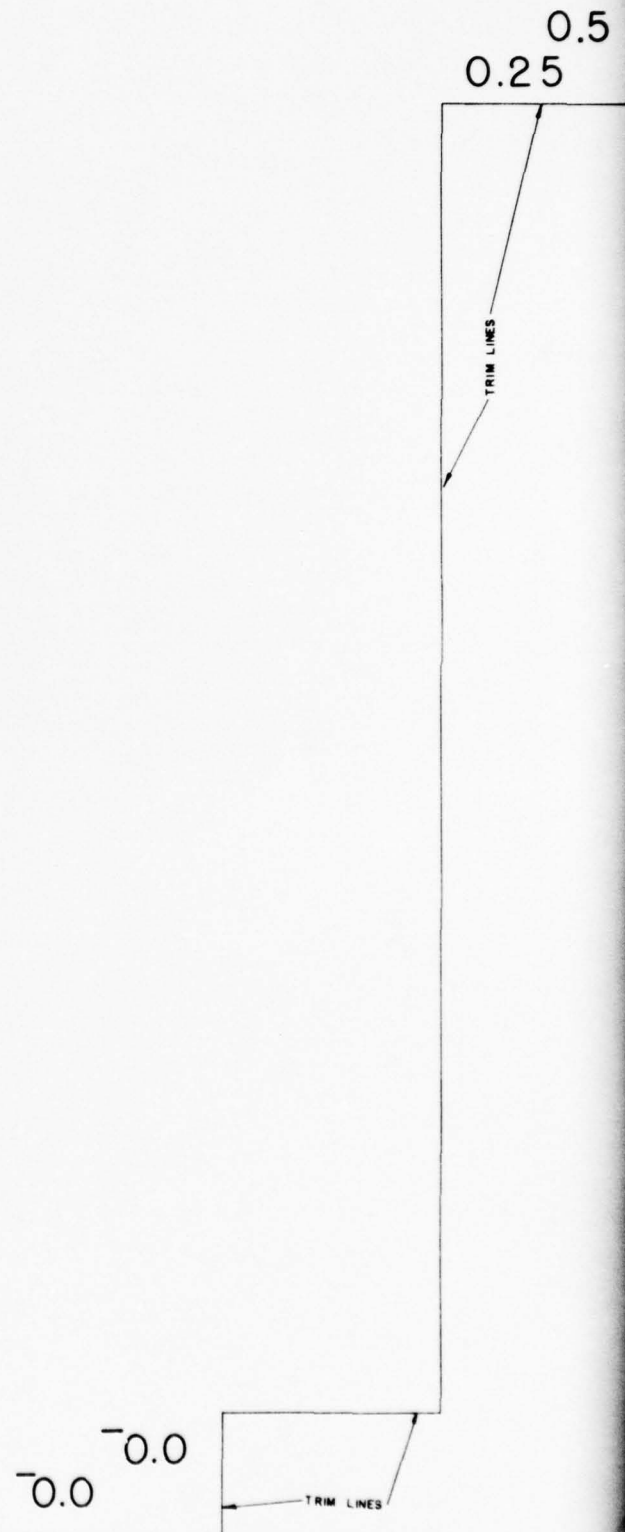
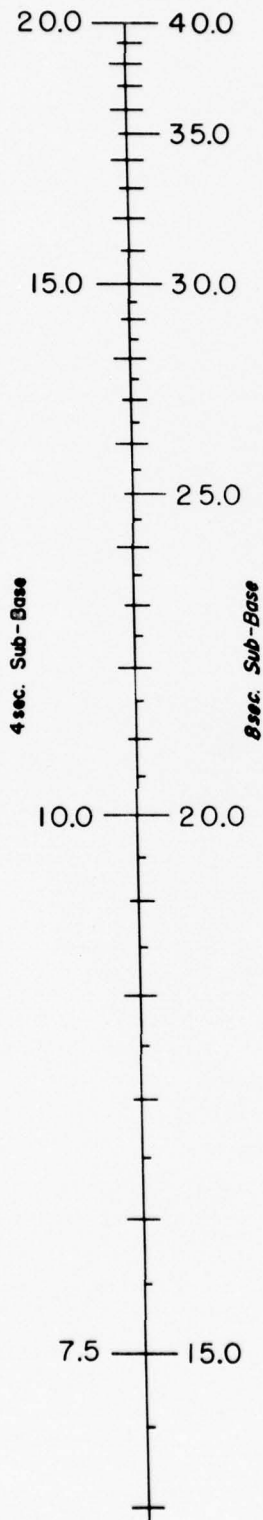
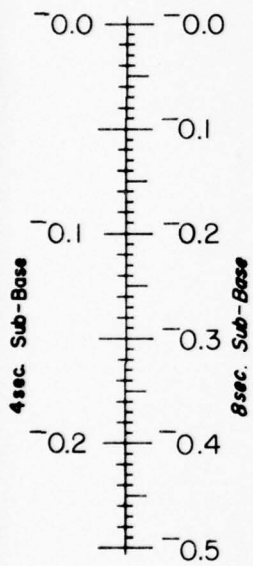
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RANGE
(Km.)

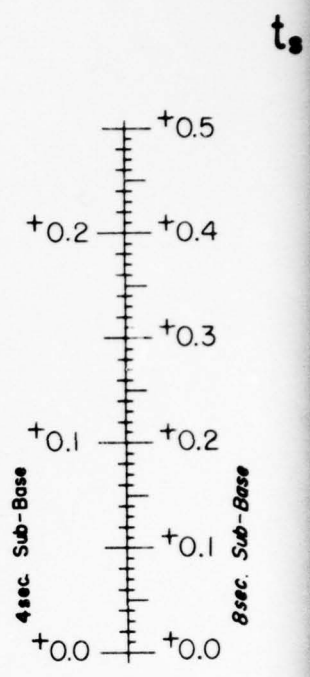
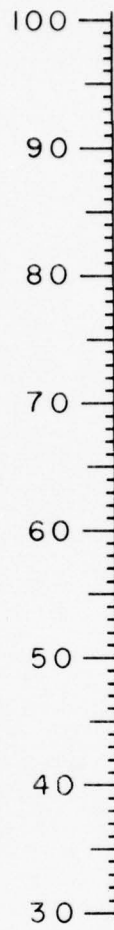
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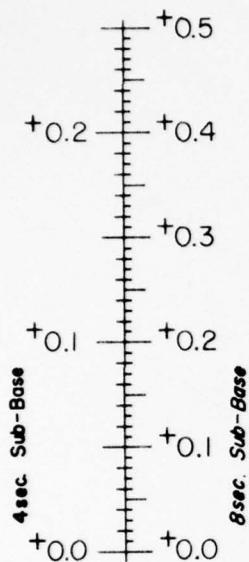




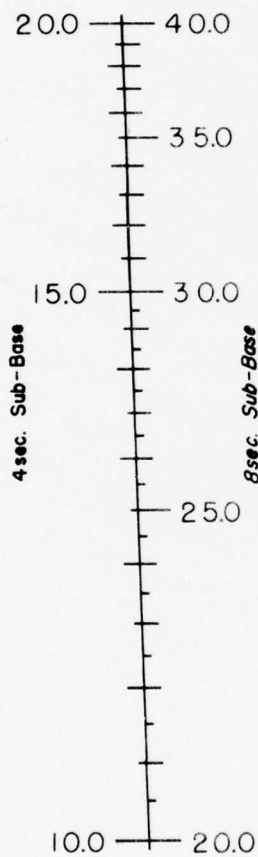
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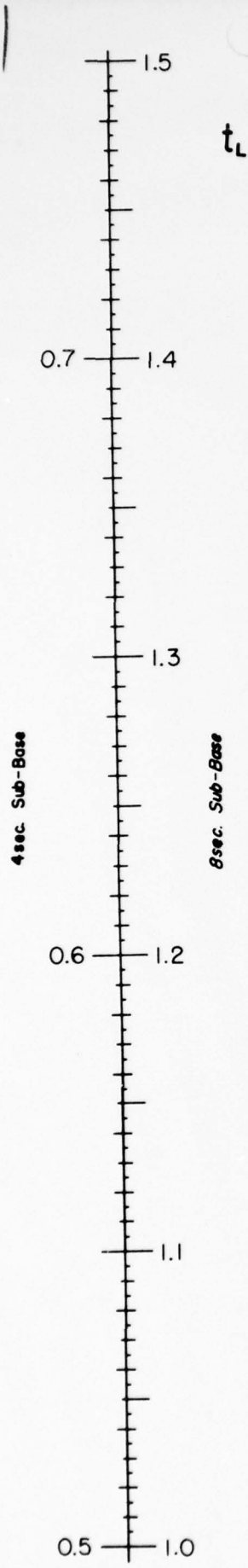


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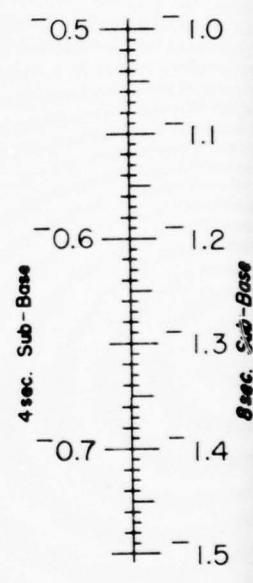
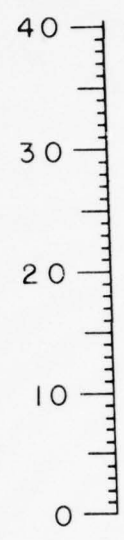
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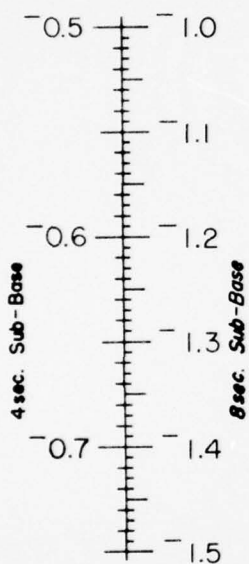


ANGLE
(mils.)



RANGE
(Km.)

t_s



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8 sec. Sub-Base

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9.0

4.0 8.0

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0.5 1.0

TRIM LINES

0.5 1.0

TRIM LINES

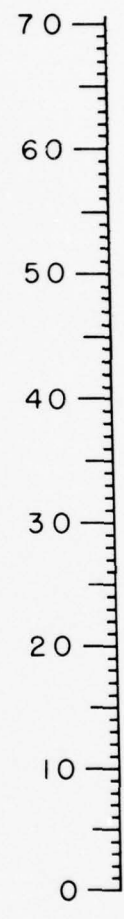
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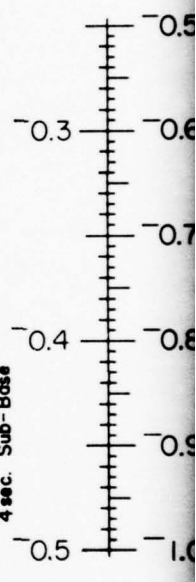


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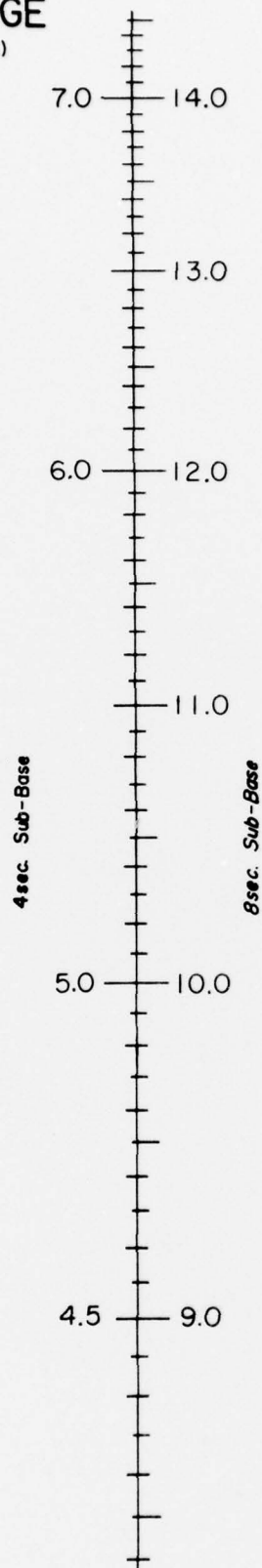
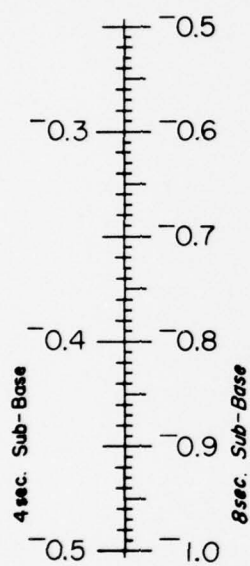
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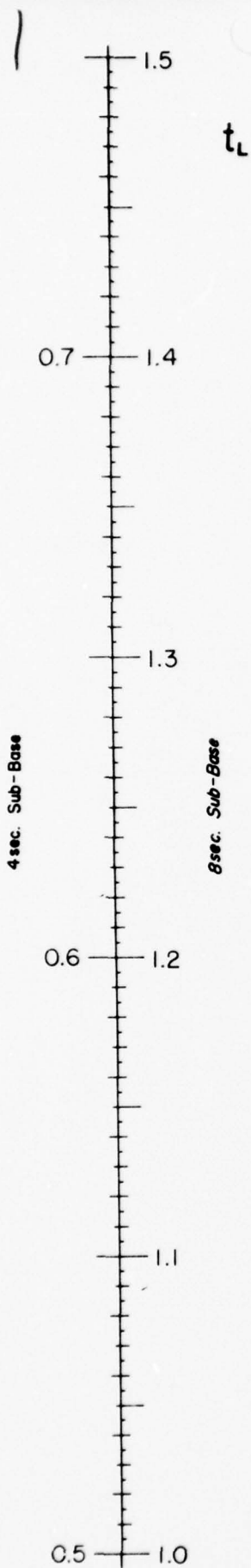


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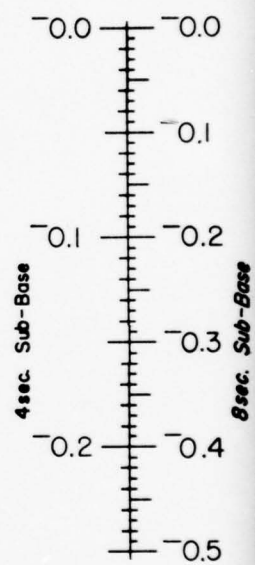
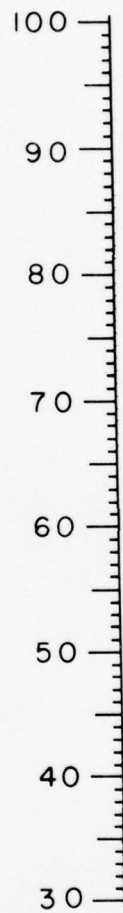
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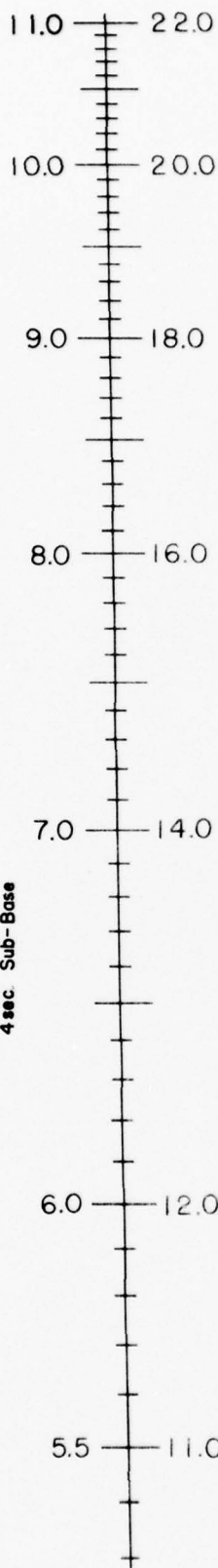
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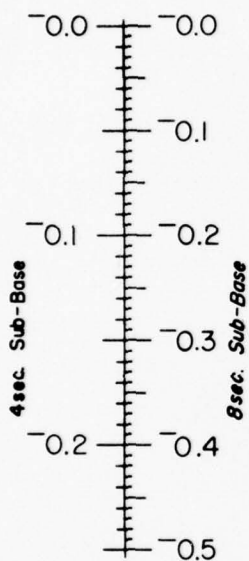
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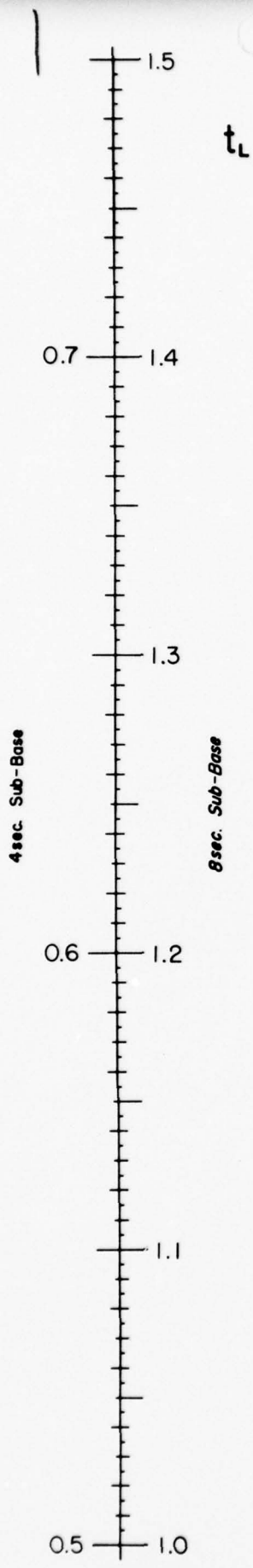
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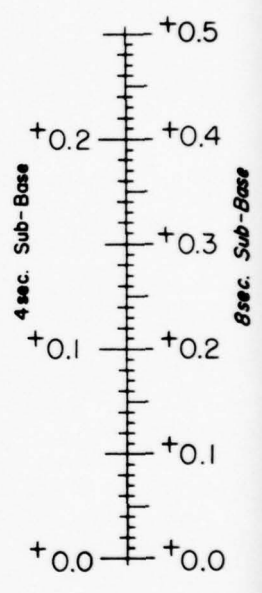
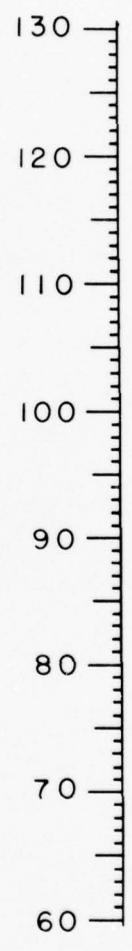
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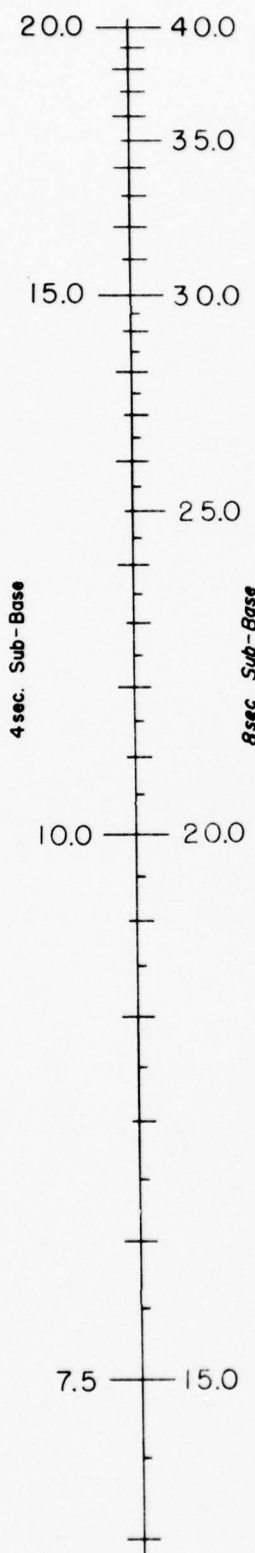
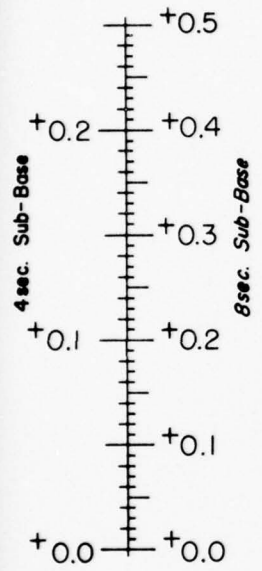


ANGLE (mils.)



RANGE
(Km.)

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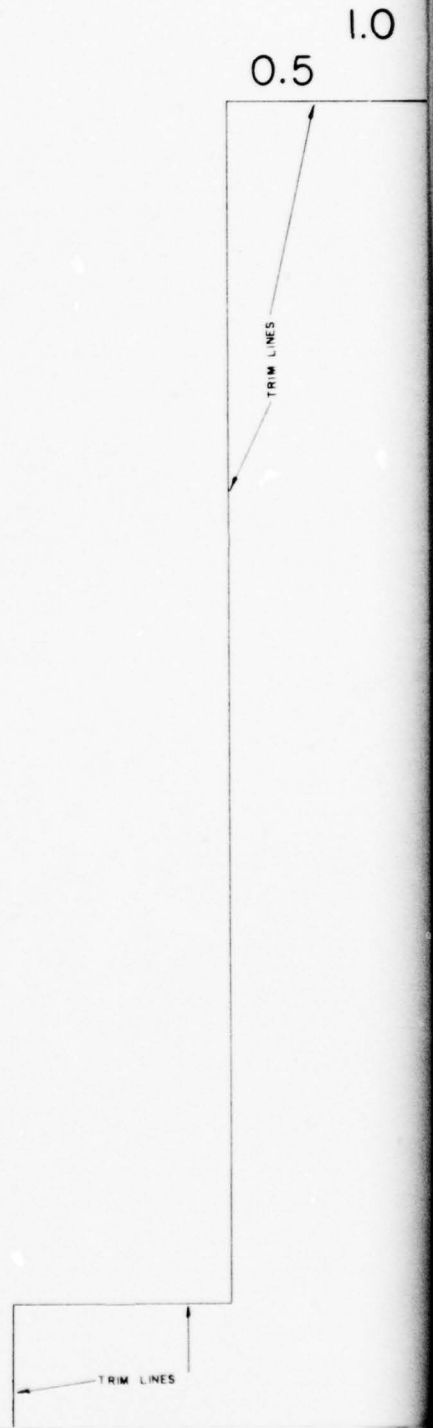


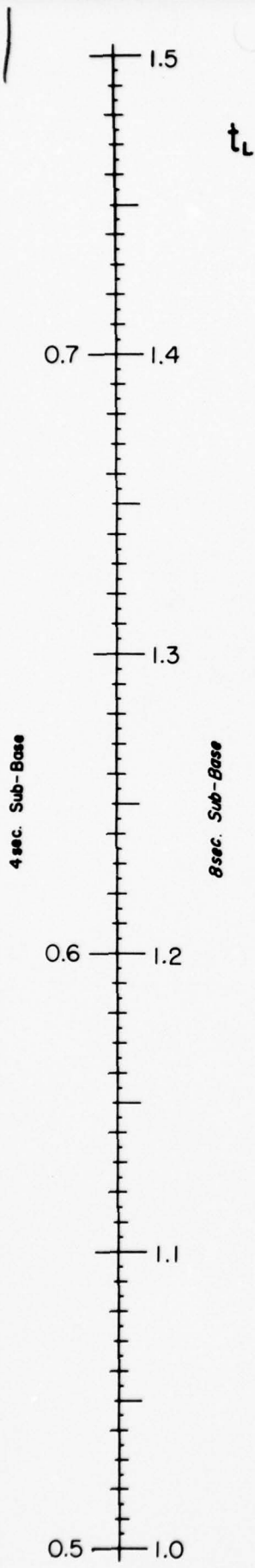
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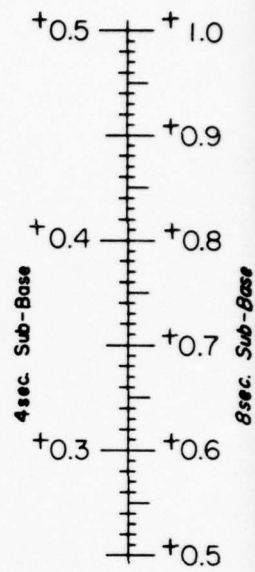
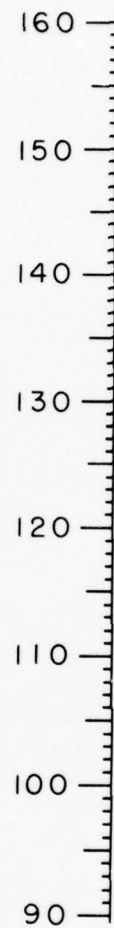
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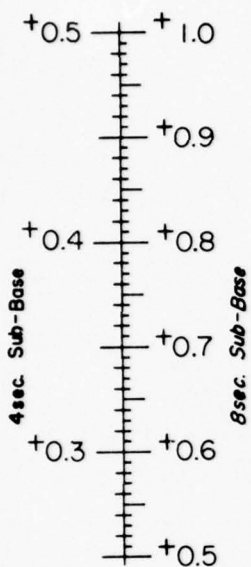




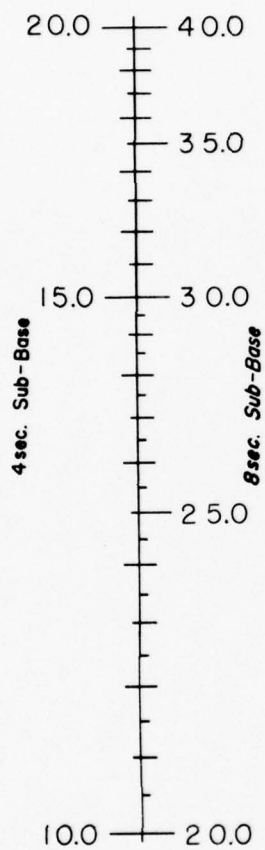
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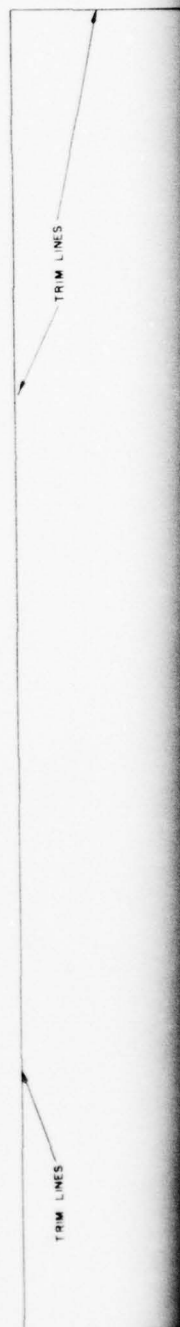
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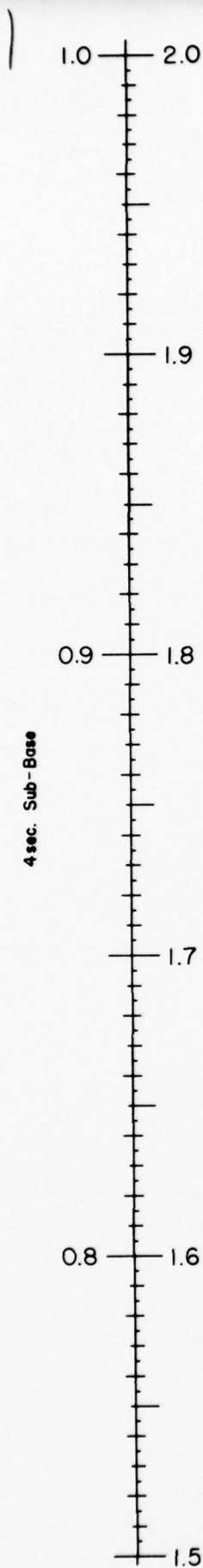
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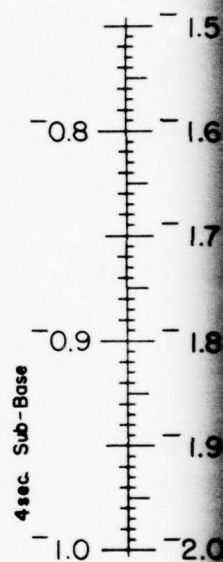
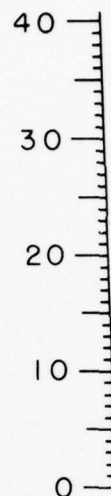


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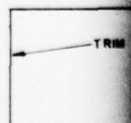


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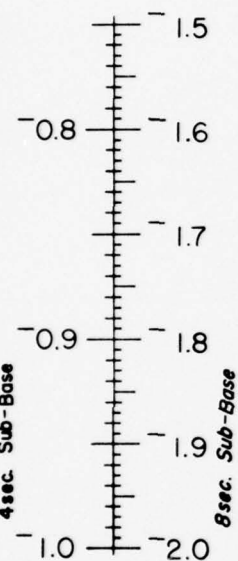
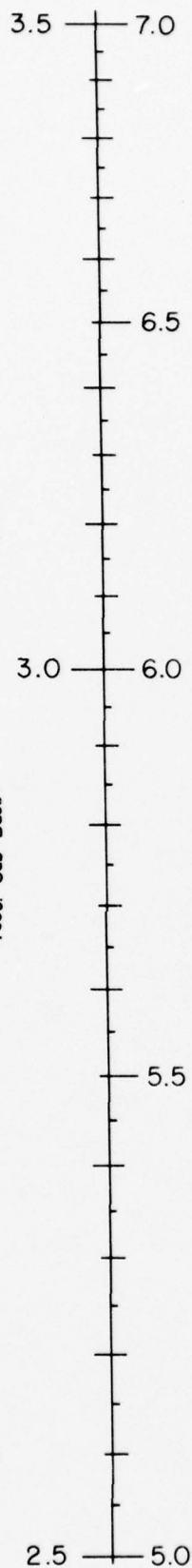


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t_s



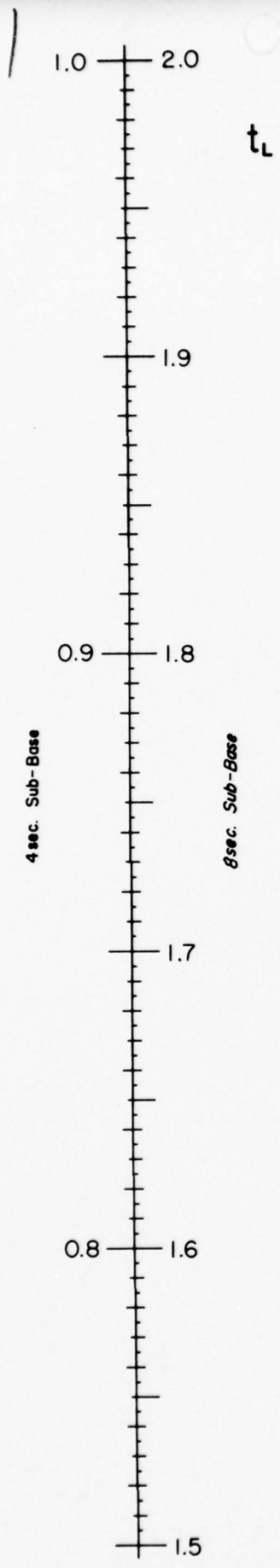
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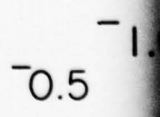
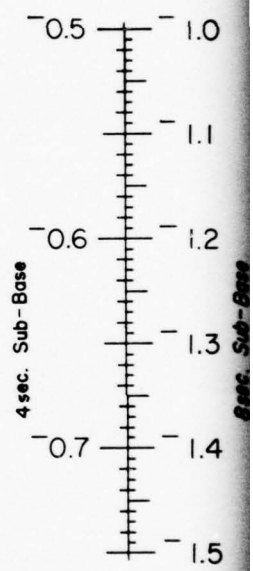
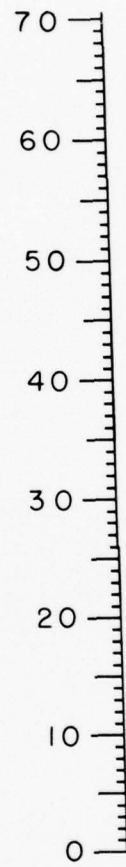
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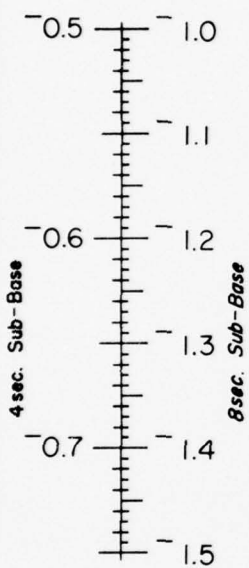


ANGLE (mils.)



RANGE
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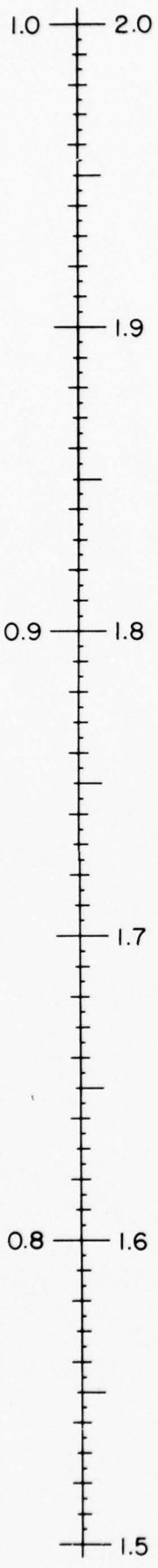
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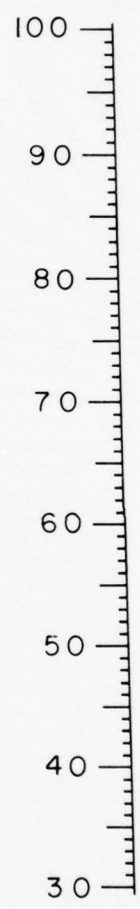
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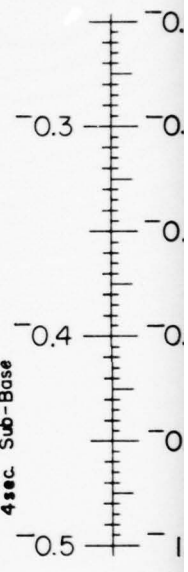


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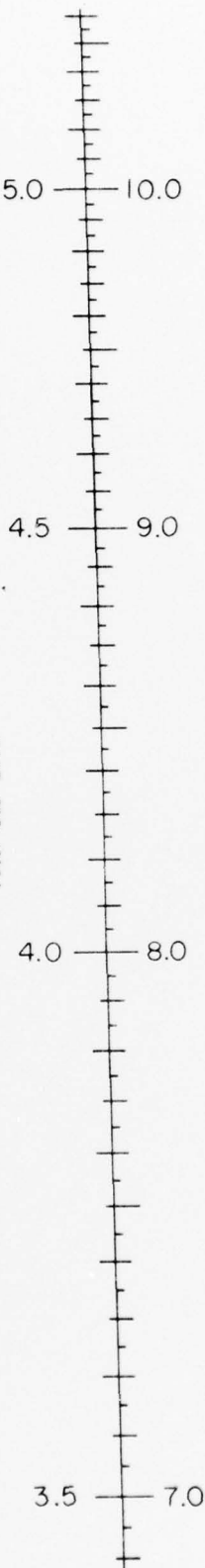
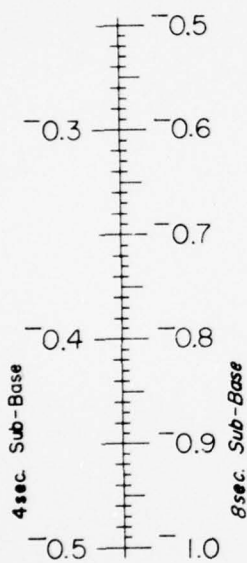


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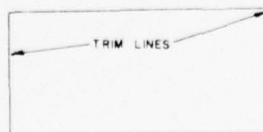


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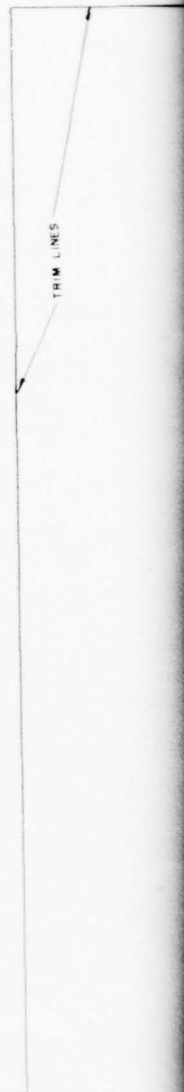
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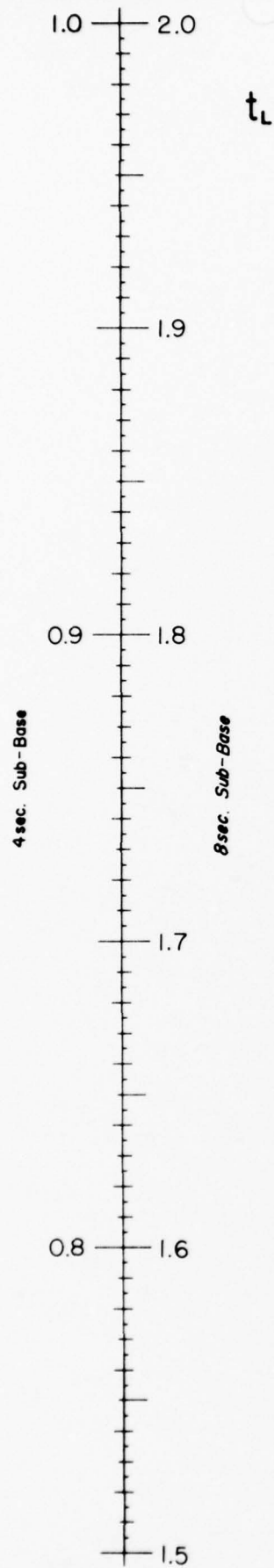


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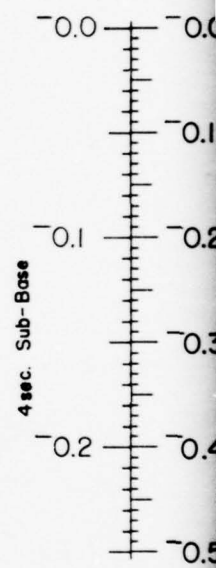


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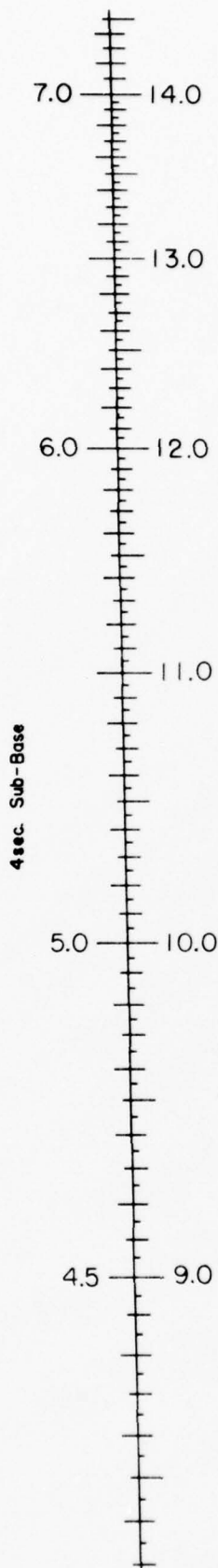
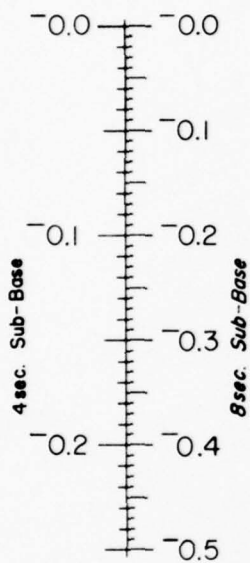
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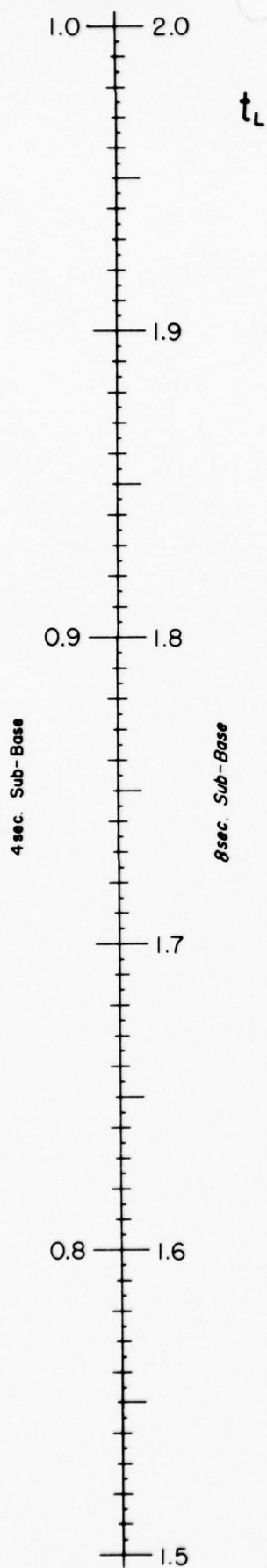
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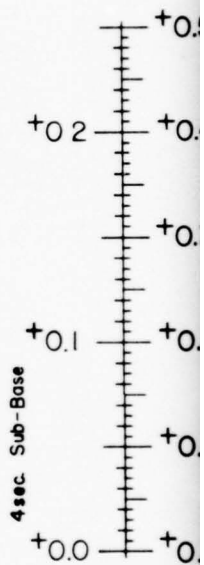
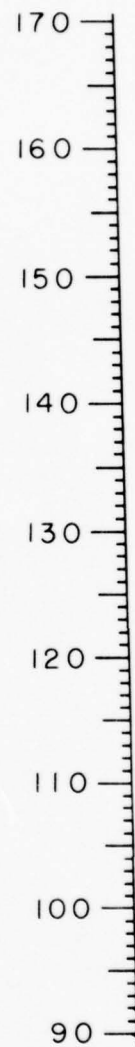
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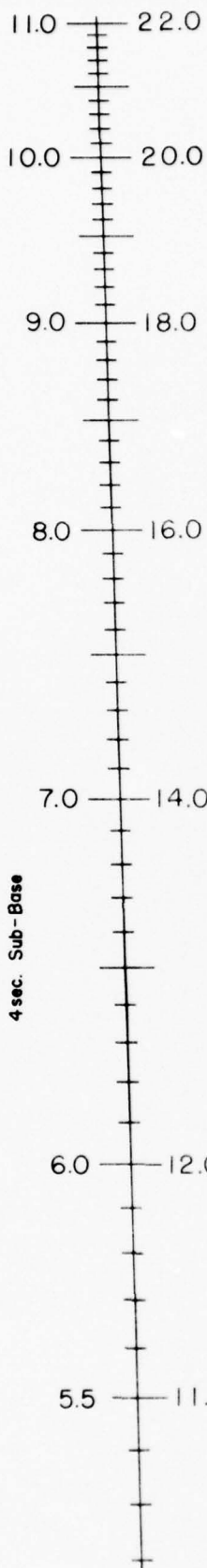
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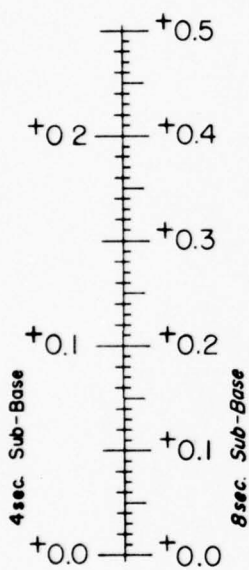
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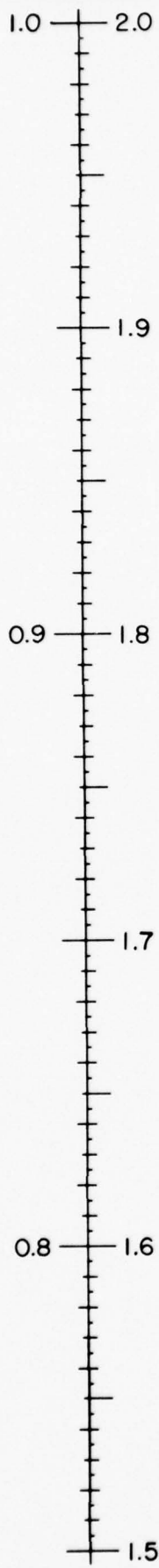
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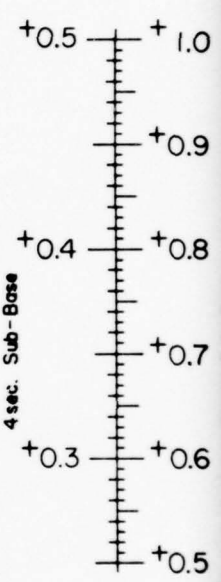
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ANGLE
(mils.)

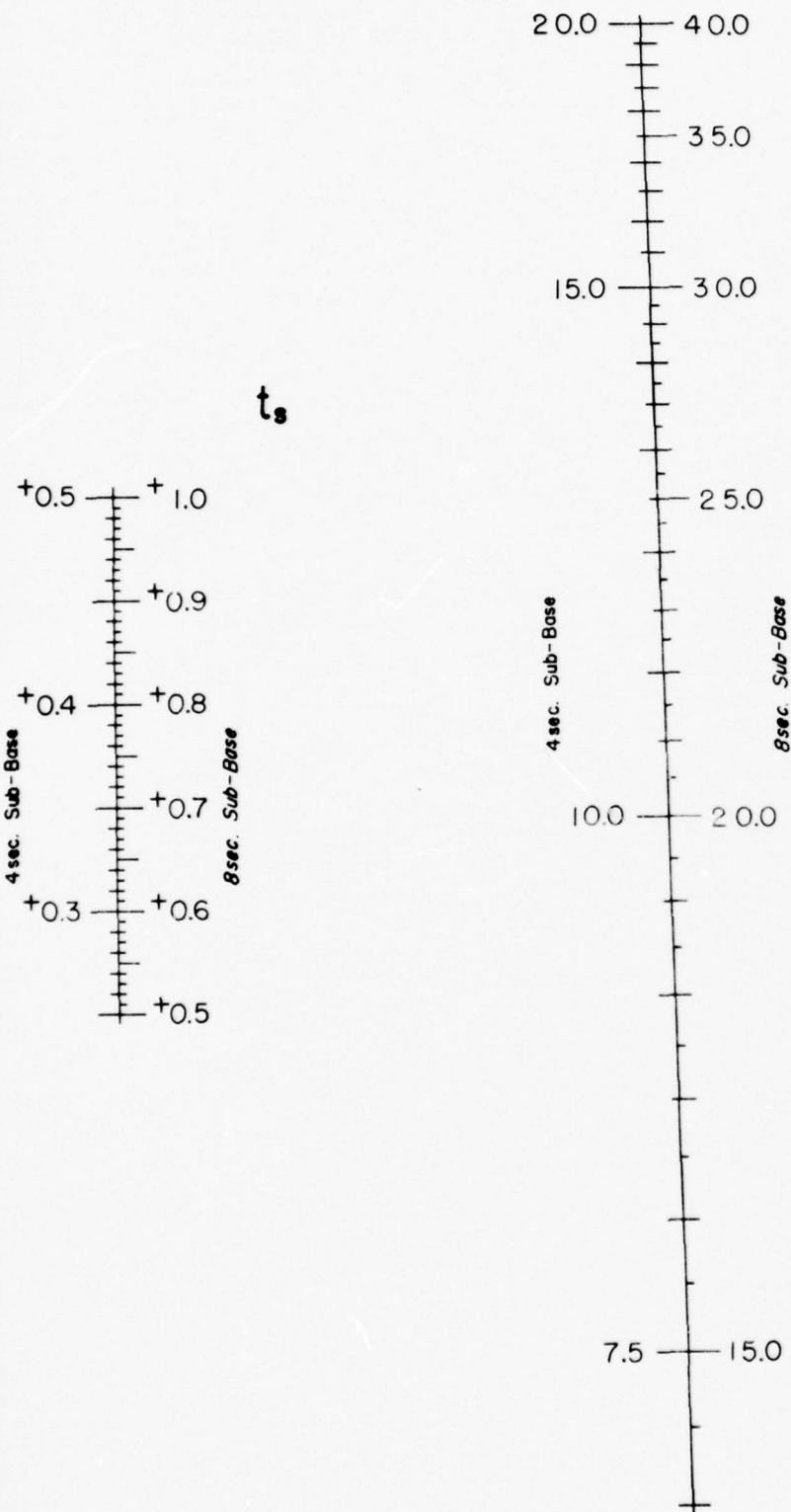


4 sec. Sub-Base

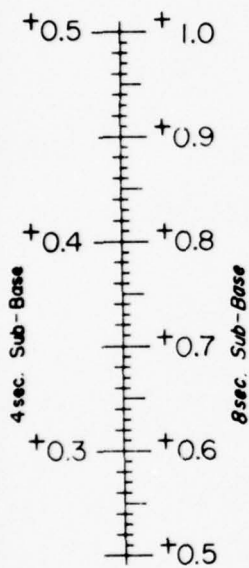
8 sec. Sub-Base



RANGE
(Km.)



t_s



1.5
0.75

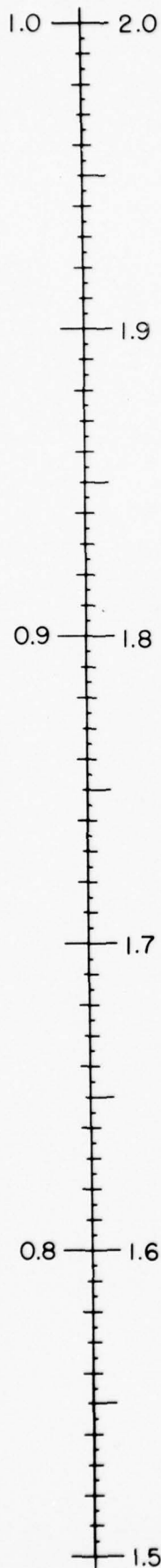
TRIM LINES

+0.5
+0.25

TRIM LINES

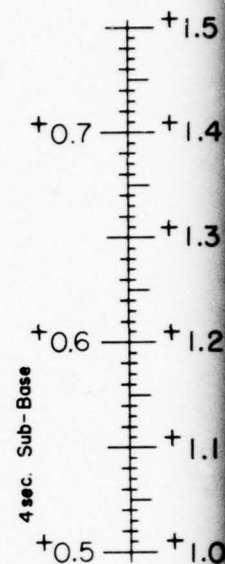
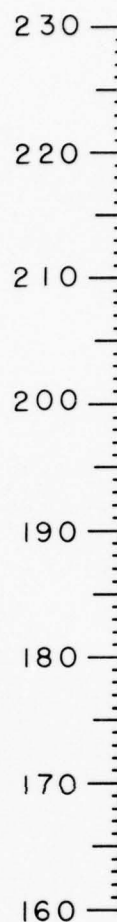
4 sec. Sub-Base

8 sec. Sub-Base

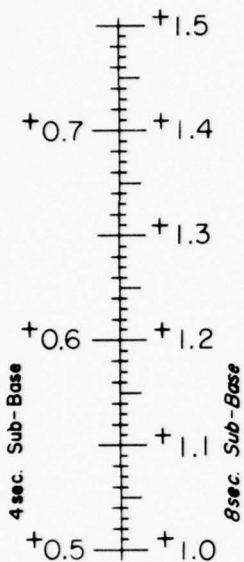


t_L

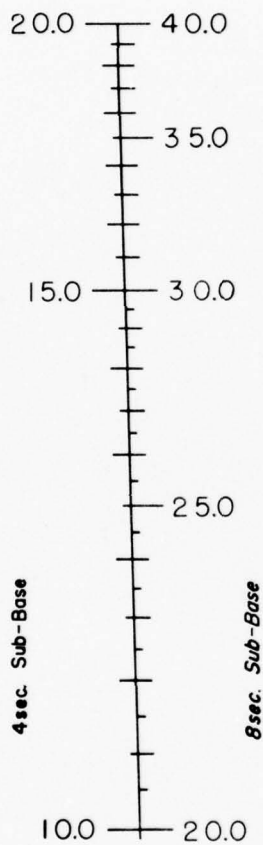
ANGLE
(mils.)



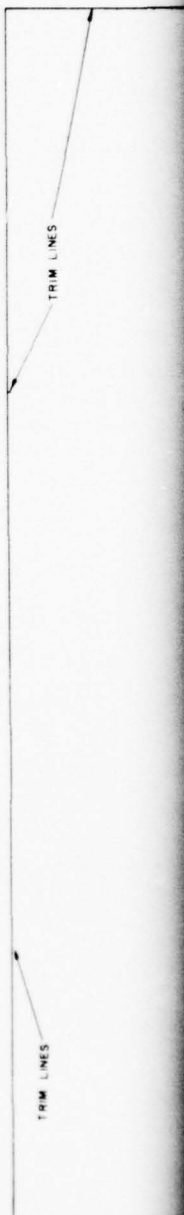
t_s



RANGE
(Km.)



1.5
0.75



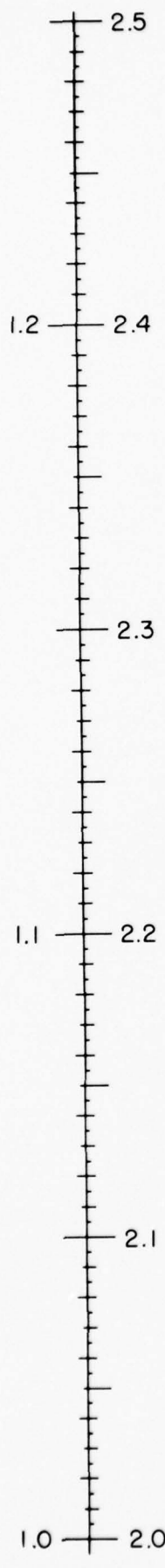
+1.0
+0.5

1

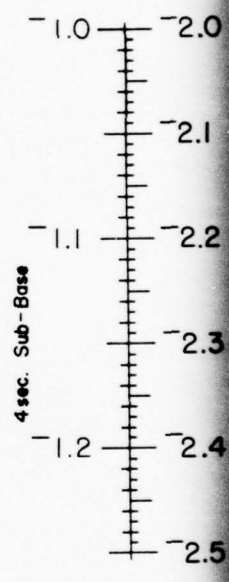
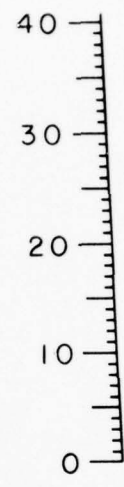
t_L

4 sec. Sub-Base

8 sec. Sub-Base



ANGLE
(mils.)



4 sec. Sub-Base

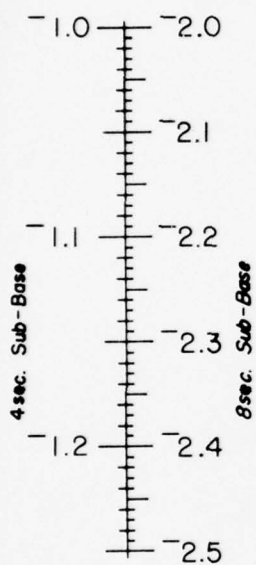
-1.0 -2.0



RANGE
(Km)

2.5 5.0

t_s



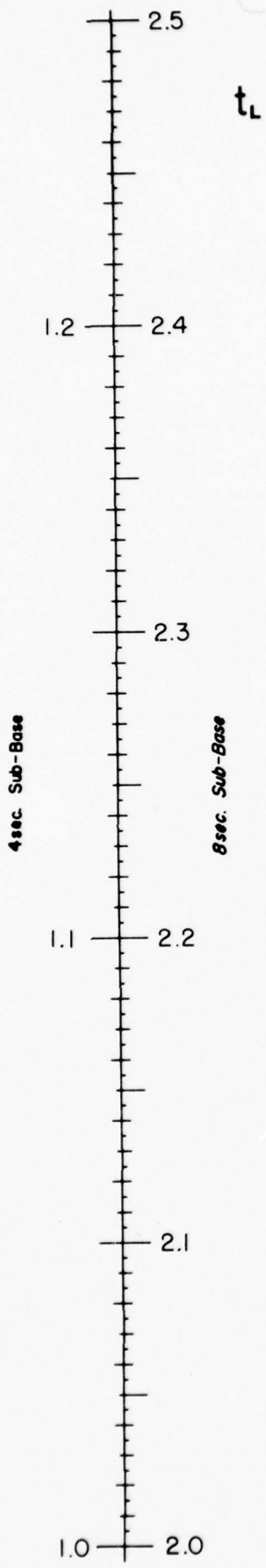
4 sec. Sub-Base

8 sec. Sub-Base

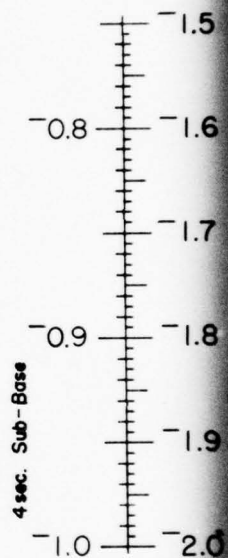
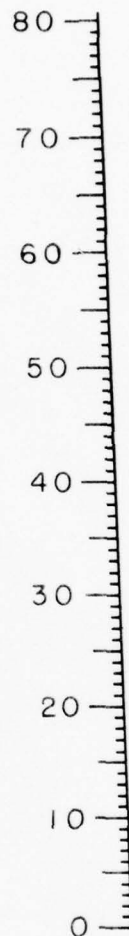
2.0 4.0

1.0 2.0

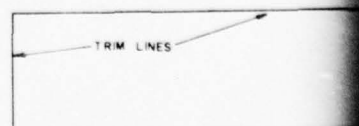
TRIM LINES



ANGLE
(mils)

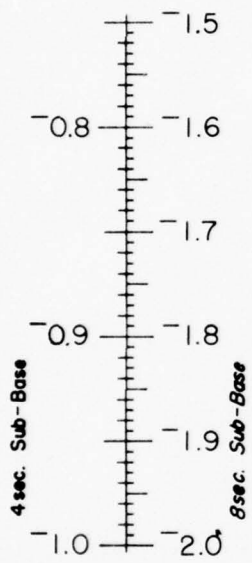


-1.5
-0.75



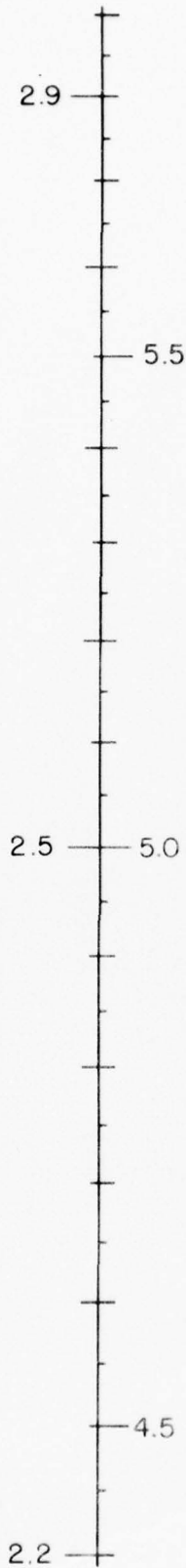
RANGE
(Km.)

t_s



4 sec. Sub-Base

8 sec. Sub-Base



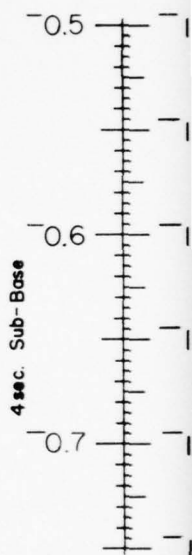
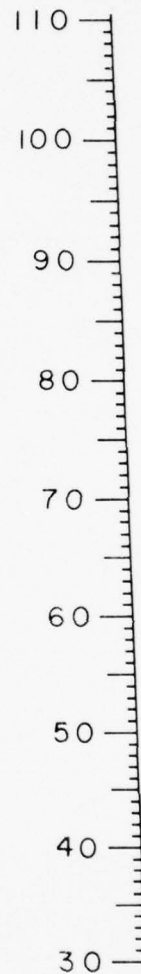
1.0 2.0

TRIM LINES

TRIM LINES



ANGLE
(mils.)



-0.5 -1.0



FLANGE
(Km)

3.5 7.0

6.5

3.0 6.0

5.5

2.5 5.0

t_s



4 sec. Sub-Base

8 sec. Sub-Base

2.0

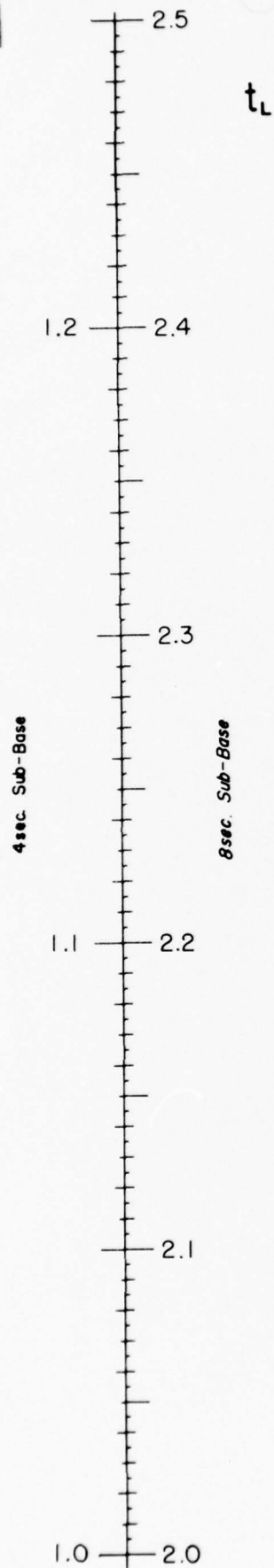
1.0

TRIM LINES

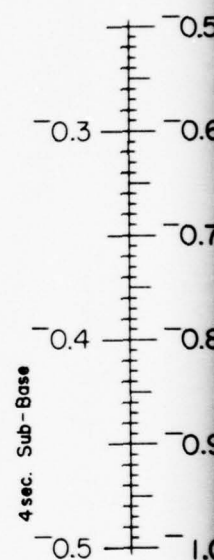
1.0

TRIM LINES

5



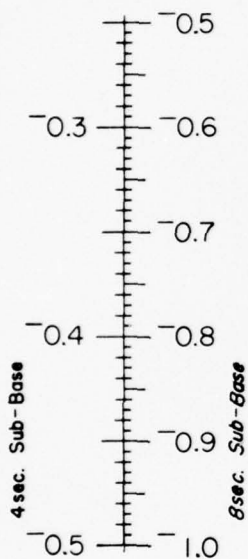
ANGLE
(mils.)



-0.25

RANGE
(Km.)

t_s



4 sec. Sub-Base

8 sec. Sub-Base

4.0 8.0

7.5

3.5 7.0

6.5

3.0 6.0

1.0 2.0

TRIM LINES

-0.5
-0.25

TRIM LINES

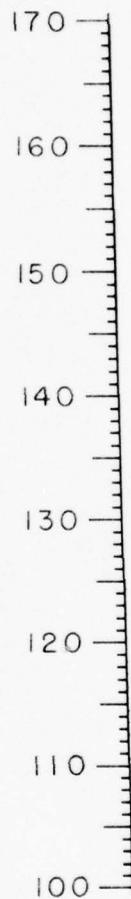
4 sec. Sub-Base

8 sec. Sub-Base

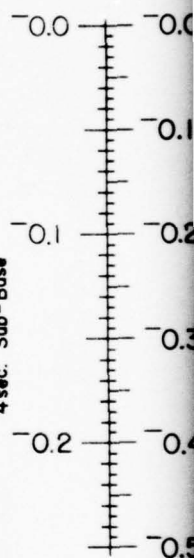
t_L



ANGLE
(mils.)



4 sec. Sub-Base



RANGE
(Km.)

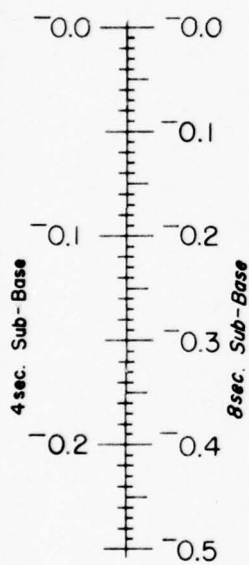
5.0 10.0

9.0

4.0 8.0

3.5 7.0

t_s



1.0 2.0

TRIM LINES

-0.0 -0.0

TRIM LINES

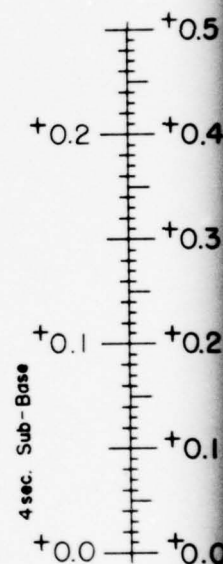
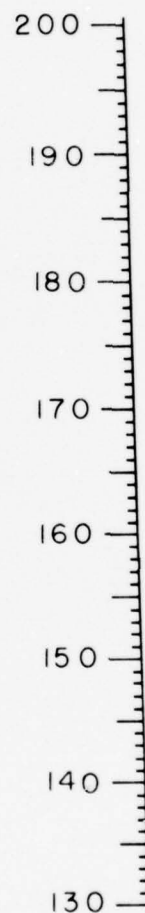
4 sec. Sub-Base

8 sec. Sub-Base

t_L

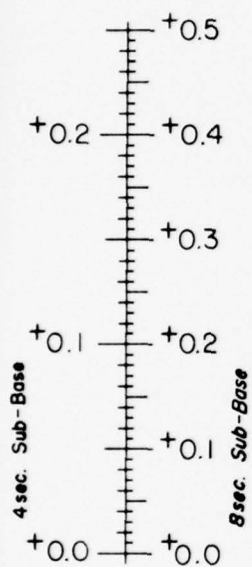


ANGLE
(mils.)



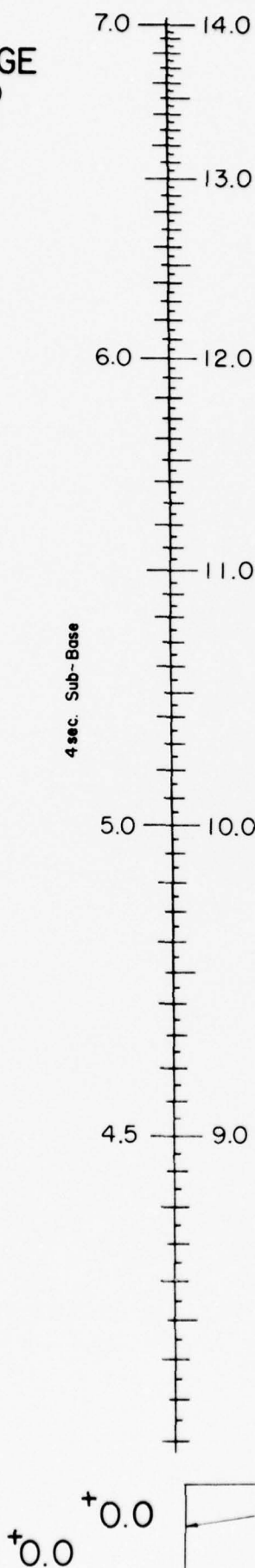
RANGE
(Km.)

t_s



4 sec. Sub-Base

8 sec. Sub-Base

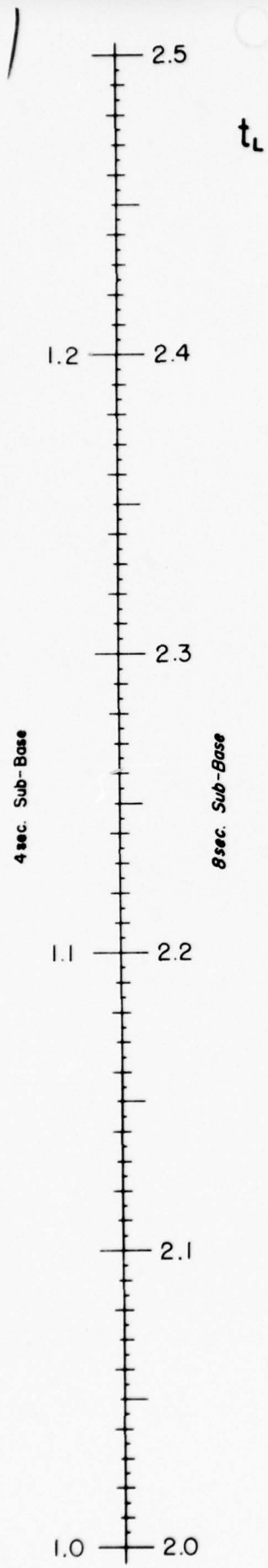


1.0 2.0

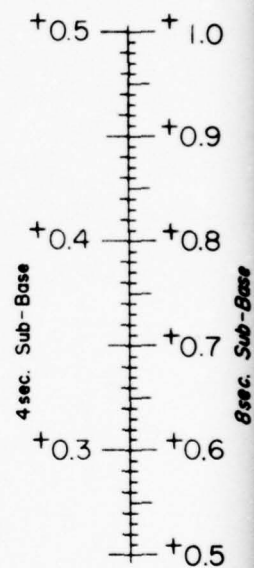
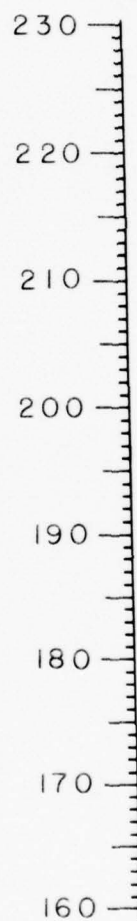
TRIM LINES

+0.0 +0.0

TRIM LINES

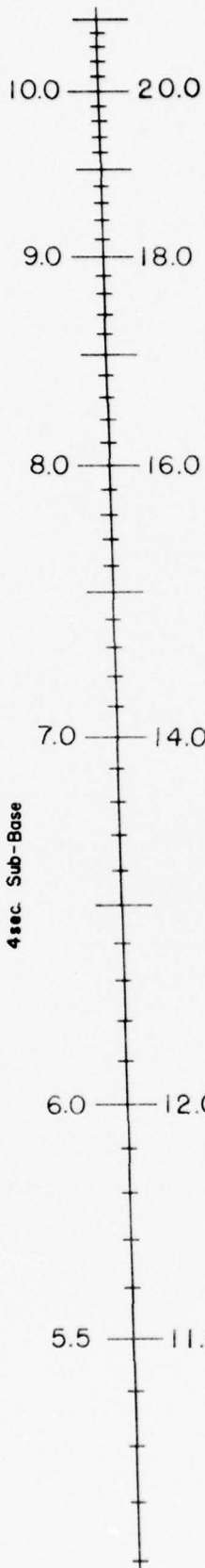


ANGLE (mils.)

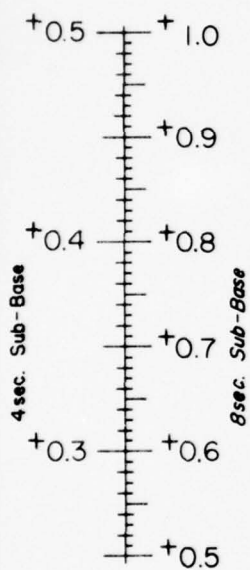


2

RANGE
(Km.)



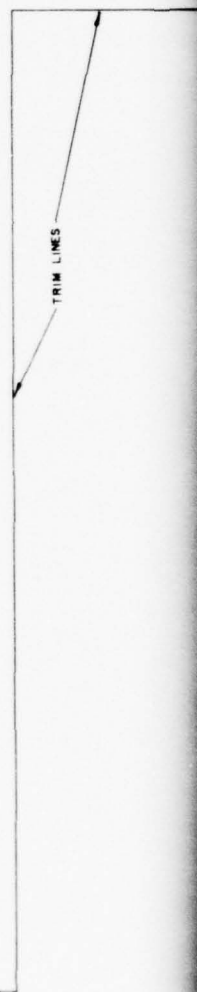
t_s



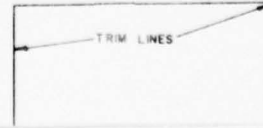
4 sec. Sub-Base

8 sec. Sub-Base

1.0 2.0



+0.5
+0.25



4 sec. Sub-Base

8 sec. Sub-Base

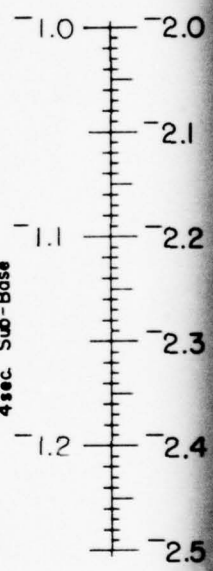


t_L

ANGLE
(mils)



4 sec. Sub-Base



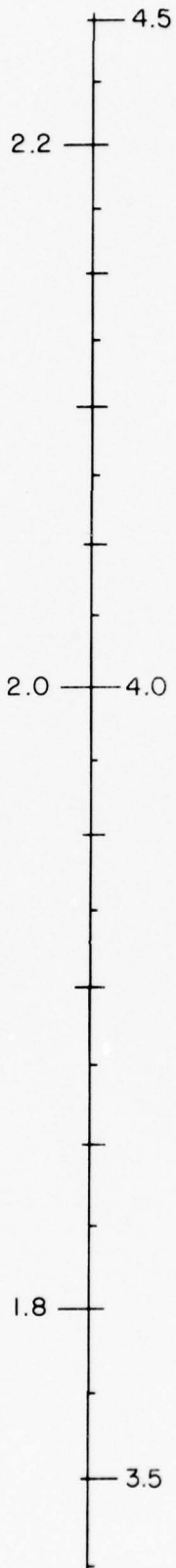
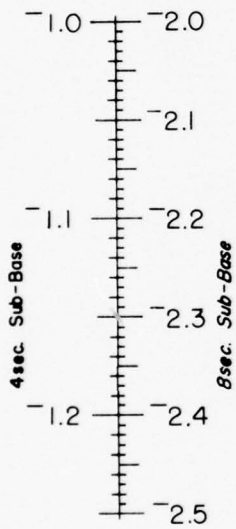
-1.0 -2.0

TRIM LINES

2

RANGE
(Km)

t_s



2.5
1.25



RANGE
(Km)

2.5 5.0

2

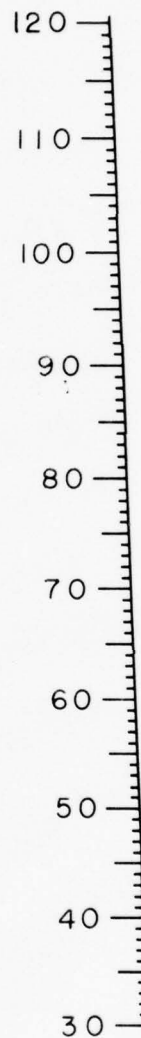
4 sec. Sub-Base

8 sec. Sub-Base

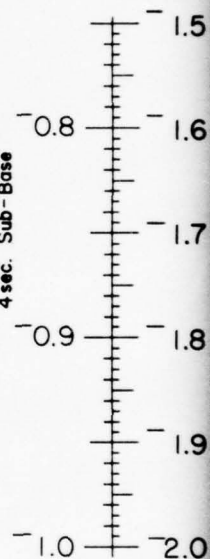
t_L



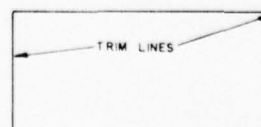
ANGLE
(mils.)



4 sec. Sub-Base



-0.75 -1.5

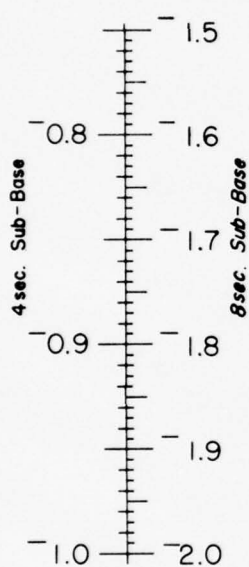


2

RANGE
(Km.)

2.5 5.0

t_s



4 sec. Sub-Base

8 sec. Sub-Base

2.0 4.0

2.5
1.25

TRIM LINES

1.5 3.0

t_L

2.9

1.4 2.8

4 sec. Sub-Base

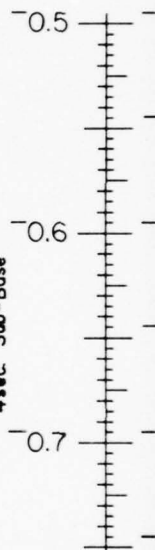
8 sec. Sub-Base

2.7

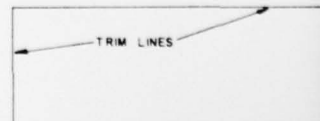
1.3 2.6

2.5

ANGLE
(mils.)

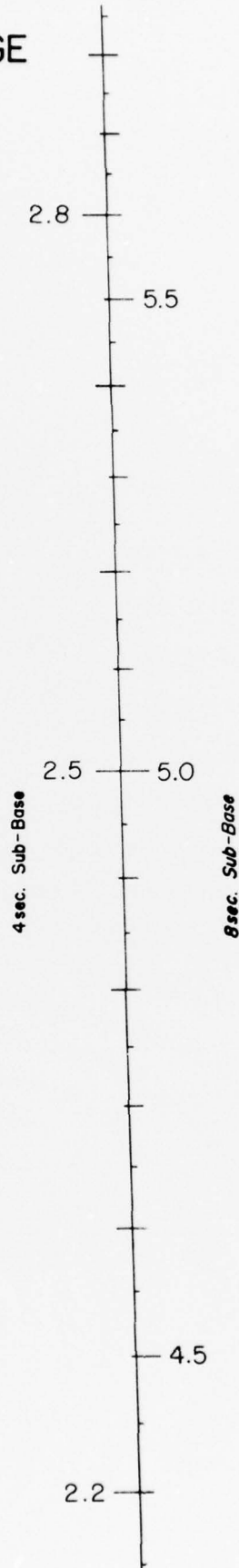
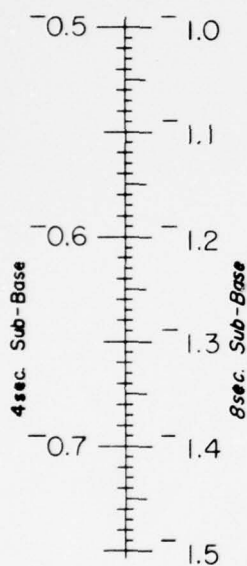


-0.5 -1.0



RANGE
(Km.)

t_s



2.5
1.25

TRIM LINES

TRIM LINES

4 sec. Sub-Base

8 sec. Sub-Base

t_L

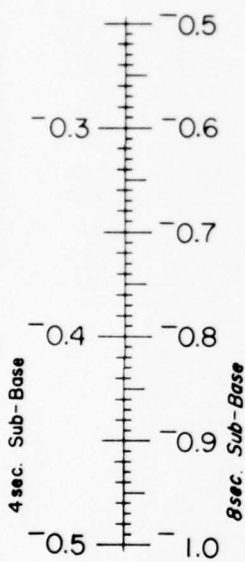
ANGLE
(mils.)

4 sec. Sub-Base

TRIM

RANGE
(Km.)

t_s



4 sec. Sub-Base

8 sec. Sub-Base

2.5 5.0

6.5

3.0 6.0

5.5

2.5
1.25

TRIM LINES

TRIM LINES

-0.5

25

t_L

-0.0

RANGE

(Km.)

4.0 8.0

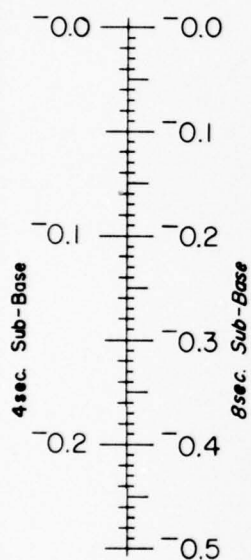
7.5

3.5 7.0

6.5

3.0 6.0

t_s



4 sec. Sub-Base

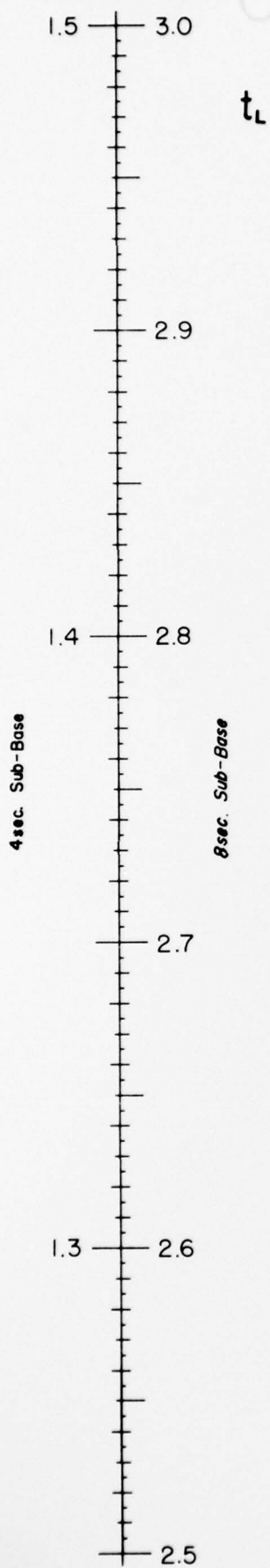
8 sec. Sub-Base

2.5
1.25

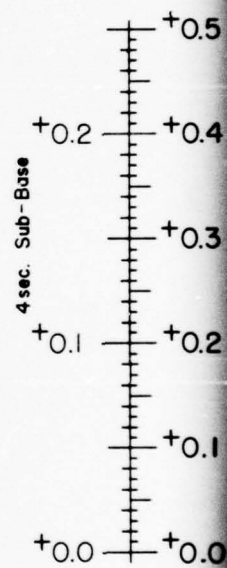
TRIM LINES

-0.0 -0.0

TRIM LINES



ANGLE
(mils.)



RANGE
(Km)

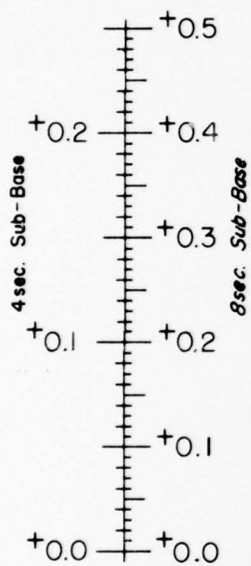
5.0 10.0

9.0

4.0 8.0

3.5 7.0

t_s



4 sec. Sub-Base

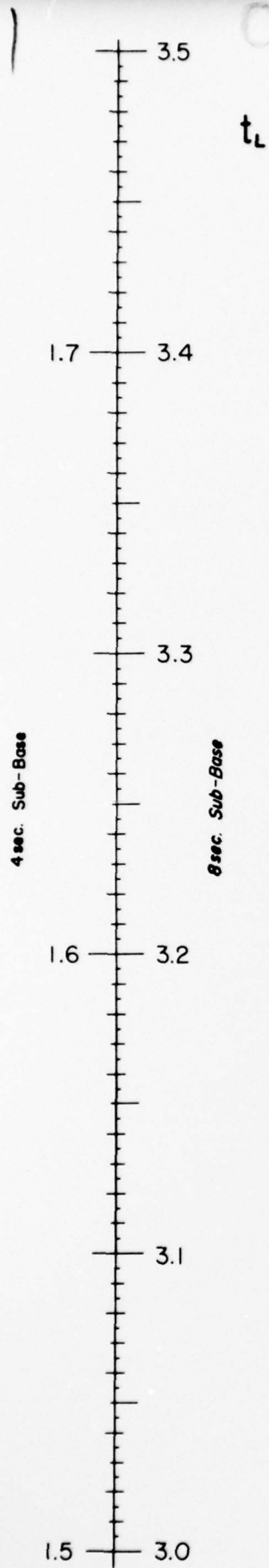
8 sec. Sub-Base

2.5
1.25

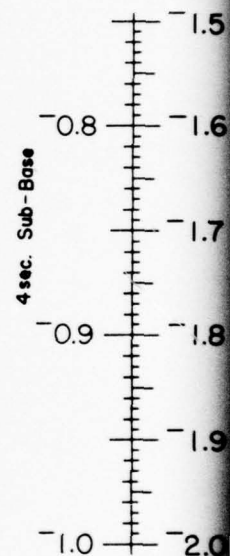
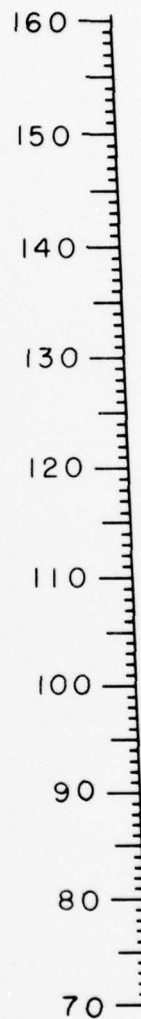
TRIM LINES

+0.0
+0.0

TRIM LINES

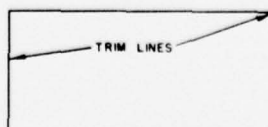


ANGLE
(mils.)



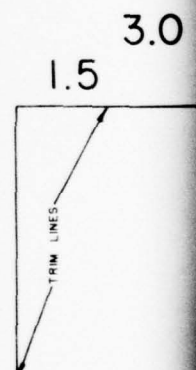
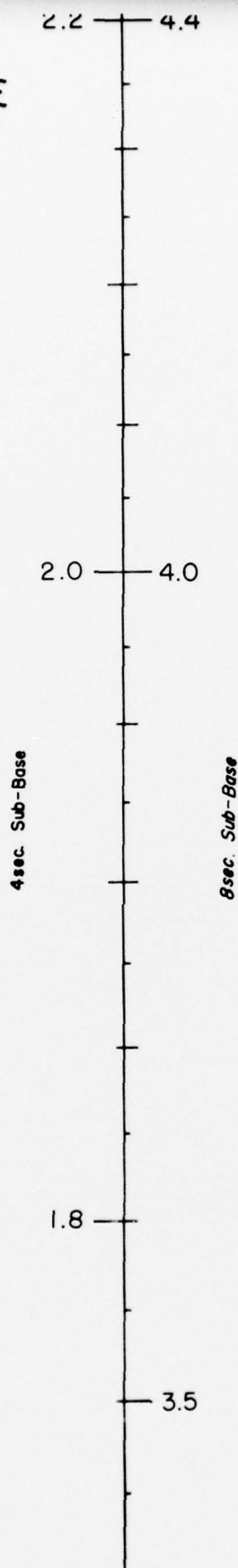
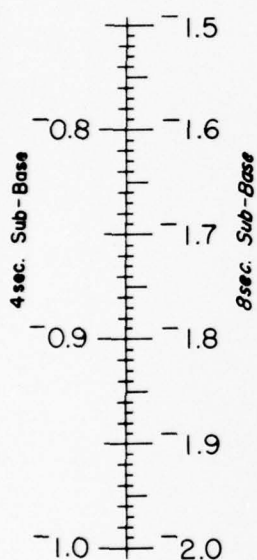
-1.5

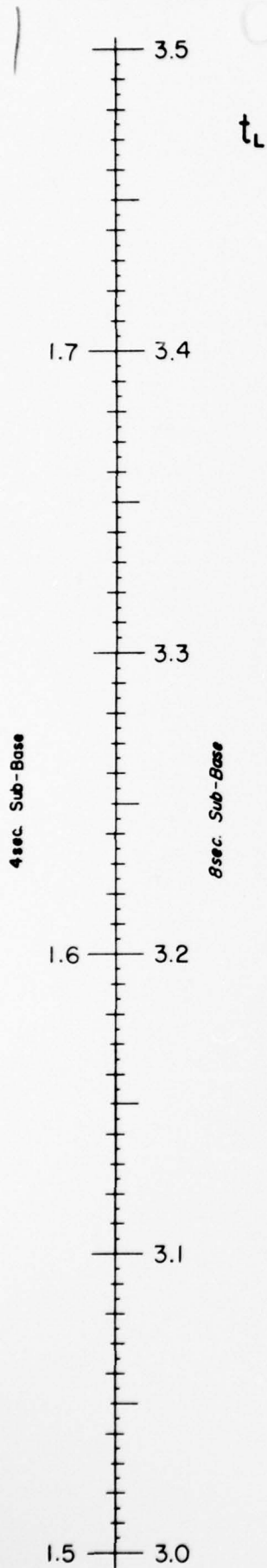
-0.75



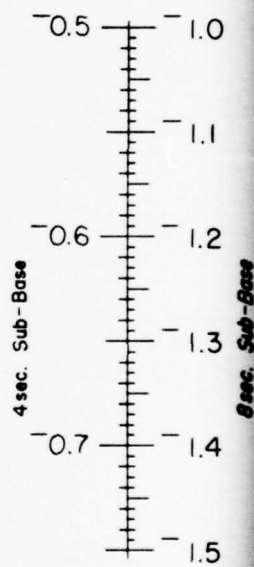
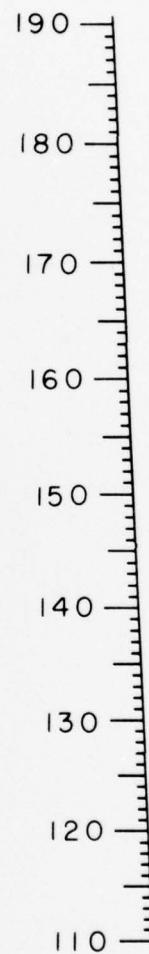
RANGE
(Km)

t_s

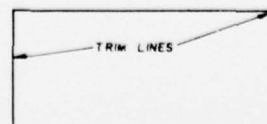




ANGLE
(mils.)



-0.5 -1.0

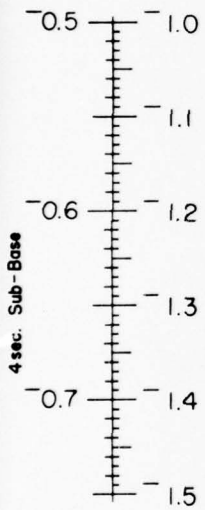


RANGE
(Km)

2.5 5.0

2

t_s



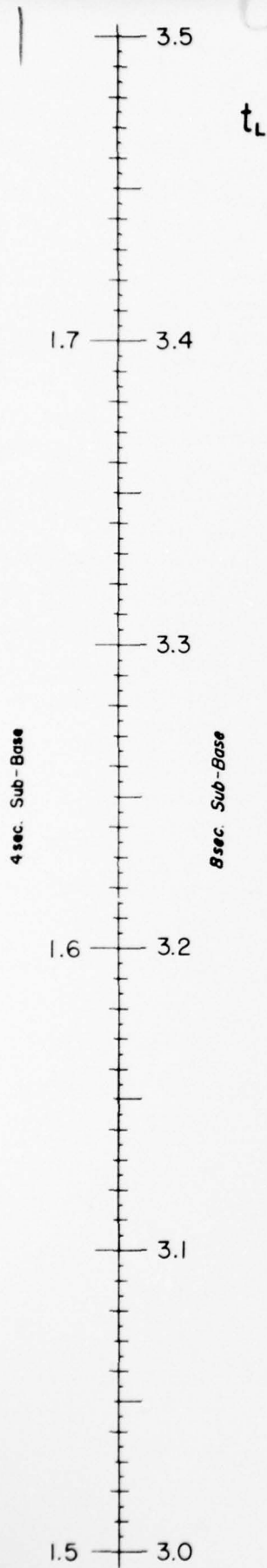
4 sec. Sub-Base

8 sec. Sub-Base

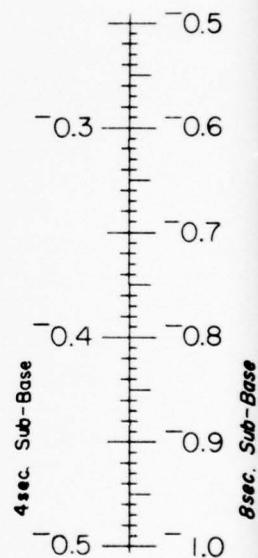
2.0 4.0

1.5 3.0

TRIM LINES

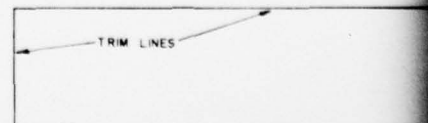


ANGLE
(mils.)



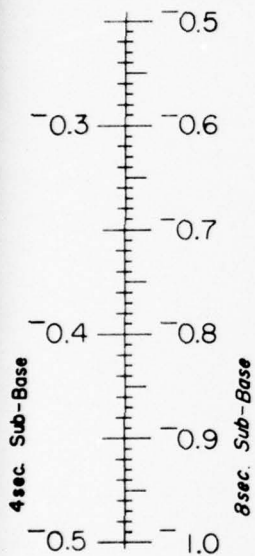
-0.25

-0.5



RANGE
(Km.)

t_s

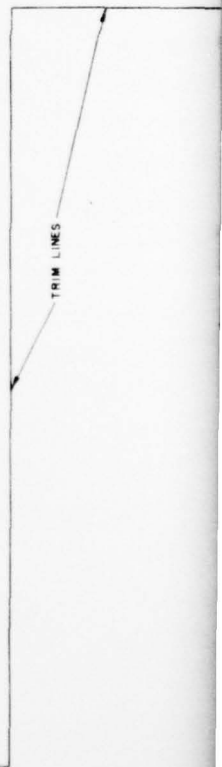


4 sec. Sub-Base

8 sec. Sub-Base

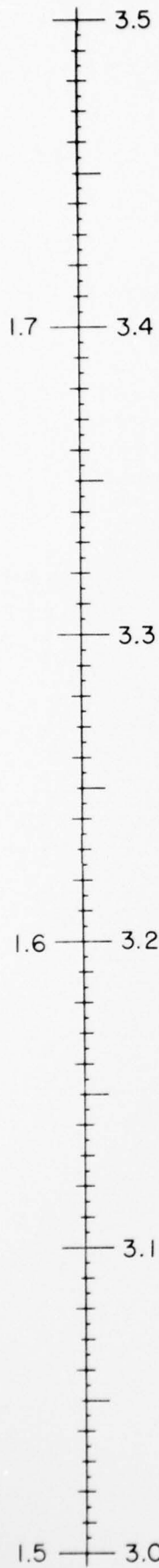


1.5 3.0



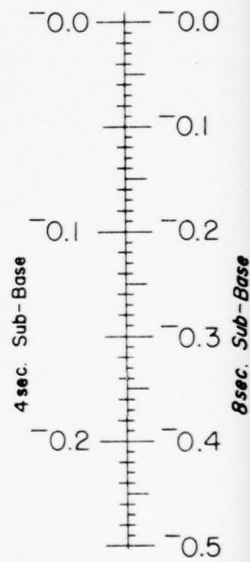
4 sec. Sub-Base

8 sec. Sub-Base



t_L

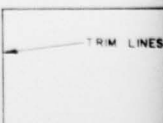
ANGLE
(mils.)



4 sec. Sub-Base

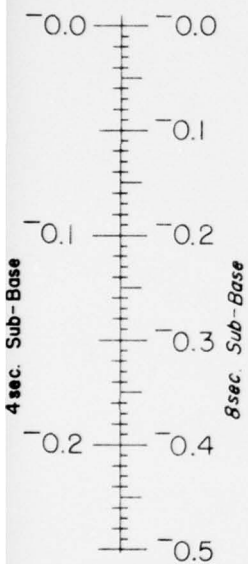
8 sec. Sub-Base

-0.0 -0.0



RANGE
(Km.)

t_s



4sec. Sub-Base

8sec. Sub-Base

1.5 3.0

TRIM LINES

TRIM LINES